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**Determinants of Effective Teams:
A Model for Resource Teams in the Hellenic Navy**

**By: Vasiliki Sartzetaki
December 2011**

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**DETERMINANTS OF EFFECTIVE TEAMS: A MODEL FOR RESOURCE
TEAMS IN THE HELLENIC NAVY**

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Military Academy of Corps Officers, 2001

Submitted in partial fulfillment of the requirements for the degree of

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ABSTRACT

In an environment of limited budgets Greek resource teams serve as a critical tool in maximizing return on investment (ROI). Finding ways to lower costs while maintaining efficiency is one of the key issues for the Hellenic Navy Logistics Command. The purpose of this report is to examine how these teams can increase their efficiency and effectiveness and ultimately achieve better financial results.

The focus of this study is to define a model of team effectiveness, analyze the determinants of high performance teams, describe their appropriate design and processes in order to be successful as well as to develop a diagnostic mechanism for assessing team effectiveness.

The project presents the resource teams in the Hellenic Navy and two team-oriented, management approaches implemented by the U.S. Navy. The reasons that a team is the ideal organizational unit are analyzed, a review of team effectiveness models is conducted and representative models are provided. Finally, the findings from the literature review are integrated into a systems model and a survey to assess team effectiveness; organized in three perspectives (Inputs-Process-Outputs). These instruments analyze the key characteristics of high performance teams.

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LIST OF ACRONYMS AND ABBREVIATIONS

ADM	Admiral
BRT	Barrier Removal Team
CFT	Cross-functional Team
CNO	Chief of Naval Operations
CRT	Current Readiness Team
DoD	Department Of Defense
EXCOMM	Executive Committee
FCT	Future Capabilities Team
FOM	Figures of Merit
FRT	Future Readiness Team
FY	Fiscal Year
HN	Hellenic Navy
IPO	Input Process Output
IPPD	Integrated Product and Process Development
IPT	Integrated Product (Process) Team
KSA	Knowledge Skills Attitude
LCAC	Light Cushioned Air Controlled
LCU	Landing Craft Unit
NATO	North Atlantic Treaty Organization
NAVAIR	Naval Air Systems Command
OMT	Overall Metrics Team
PESTO	People, Equipment, Supply, Training, and Ordnance
PPBE	Planning Programming Budgeting and Execution
PRT	Performance Readiness Team
RAND	Research and Development
ROI	Return on Investment
RTO	Research and Technology Organization
SCT	Strategic Communications Team

SFMT	Strategic Financial Management Team
ST1	Surface Team One
SWE	Surface Warfare Enterprise
TBO	Team Based Organization
USN	United States Navy
VADM	Vice Admiral

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– **Alexander the Great**

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I. INTRODUCTION

A. PURPOSE AND OBJECTIVES OF RESEARCH

In an environment of limited budgets, Hellenic Navy Resource teams serve as a critical tool in maximizing return on investment (ROI). The purpose of this report is to examine how these teams can increase their efficiency and effectiveness and ultimately achieve better financial results. The focus of the study is on defining a model of team effectiveness, analyzing the determinants of high performance teams, describing their appropriate design and processes, and building a diagnostic mechanism for assessing team effectiveness. Also, the study examines the practices implemented by United States Resource Teams and the possible adaptation of them by the Hellenic Navy.

B. BACKGROUND

In the midst of a severe financial crisis, the Greek uniformed forces are directed to do more with less. Finding ways to lower costs while maintaining efficiency is one of the key issues for the Hellenic Navy Logistics Command. In light of ongoing military operations and the substantially limited resources, the Supply teams have to operate at the highest level of efficiency and effectiveness. Successful team-based models and processes identified by this research may provide a basis for increasing resource team effectiveness in the Hellenic Navy.

The Hellenic Navy Supply Center's (HNSC) mission is to implement the supply program of the Hellenic Navy. Financial support and policy direction is given by the Hellenic Navy General Staff. The Supply Center reports to the Hellenic Navy Logistics Command, which supports all Naval Units and activities of the Hellenic Navy.

The tasks carried out by the Hellenic Navy Supply Center include the following:

- Inventory Management of more than 500,000 items, spare and repair parts
- Procurement of all the above supplies, equipment, machinery, and tools as well as contracting with the private sector for all services needed

- Dispatch and retrieval of all kinds of equipment from/to foreign or domestic cities/countries
- Management of Hellenic Navy Supply Center's budget
- Preparation of statistical and cost analysis reports for materials and supplies.

The plethora and the complexity of the tasks and the interdependence among the team members working in the Standard Functional Departments of the nine Directorates of the Hellenic Supply Center initiates the interest of implementing the best methods to achieve team effectiveness. Examining the processes, critical factors and characteristics of high performance teams and recommending ways to apply them in the Hellenic Supply Center is the focus of the research.

C. RESEARCH QUESTIONS

1. Primary Question

What are the characteristics, critical processes and key success factors of high performance teams?

2. Secondary, Supportive Research Questions

- Is the team concept applicable to Resources Teams in the Hellenic Navy?
- What is the U.S. Navy team approach in Surface Warfare Enterprise (SWE) and in Integrated Product (Process) Teams (IPT's)?
- Why teams are appropriate?
- Based on the research on team effectiveness, what is the proposed model for enhancing team effectiveness in the Hellenic Navy Logistics Command?
- What are the determinants, design and processes of high-performance teams?
- What is the diagnostic mechanism to assess team effectiveness?

D. SCOPE OF RESEARCH

The scope of this research will include:

- A review of the management environment, functions, and processes of the existing Resource Teams in the Hellenic Navy
- An examination and analysis of the team approach used by the U.S. Navy in Surface Warfare Enterprise (SWE) and in Integrated Product (Process) Teams (IPT's)
- An analysis of the benefits organizations can realize by the effective implementation of teams
- A discussion of relevant literature on the team effectiveness concept and its important characteristics
- The design of a proposed team effectiveness model organized in three perspectives
- An analysis of the critical characteristics of high performance teams
- Recommendations on the development of a diagnostic system that can be applied throughout Resource Teams in the Hellenic Navy Logistics Command.

The scope will not include:

- A detailed evaluation of the current status and operations of Resource Teams in the Hellenic Navy
- A detailed plan for the implementation of the proposed design and processes of high-performance teams
- A cost and time analysis required for the implementation of the proposed team effectiveness model.

E. EXPECTED BENEFITS FROM THIS PROJECT

This research intends to provide the leaders of the Hellenic Navy Logistics Command with the determinants of high performance teams, their appropriate design and

processes in order to be successful, as well as a diagnostic mechanism for assessing team effectiveness. Furthermore, this project may provide guidelines for a pilot study for other Departments inside the Hellenic Navy Logistics Command to improve team design and performance.

F. ORGANIZATION OF STUDY

This study contains five chapters. Chapter I provides the background of the study and introduces the project subject. Also included in this chapter are comments on the purpose and the objectives of the study, primary and secondary research questions, the scope of the research, and the benefits of the study. Chapter II presents the organizational context of the research by introducing the Resource Teams in the Hellenic Navy, exploring the current use of teams, and identifying the practices used by the U.S. Military. Chapter III introduces relevant information discovered in the literature review on team effectiveness, explains why the use of teams is appropriate in the military setting, presents the most important models of team effectiveness and suggests a framework of team effectiveness. Chapter IV analyzes the research literature to identify the determinants, design and processes of high performance teams using the model of team effectiveness developed in the previous chapter to organize the findings. Chapter V presents conclusions and recommendations resulting from this project, offers a diagnostic mechanism to assess team effectiveness inside the HNSC and provides suggestions for further research

II. ORGANIZATIONAL CONTEXT

A. RESOURCE TEAMS IN THE HELLENIC NAVY – CURRENT USE OF TEAMS

Change alone is unchanging
—Heraclitus

1. INTRODUCTION

This chapter presents the resource teams in the Hellenic Navy and some of the best practices concerning team work implemented by the U.S. Navy. Its purpose is to provide an understanding on how teams are currently used in the military setting. The focus of the project is the Hellenic Navy Supply Center (HNSC). First the Center's history, mission, tasks and structure are analyzed. Next, this section discusses two specific Departments of the HNSC, the Peripheral Advisory Committee and the Special Projects Department and how teamwork is performed in these Departments. Finally, this chapter analyzes how the Enterprise concept is implemented by the U.S. military and how the Integrated Product (Process) Teams are used as a team based redesign in a large scale change.

2. ENVIRONMENT ASSESSMENT

In the globalized environment, where current challenges and threats form a compound world, unstable and unpredicted, the confrontation of security challenges demonstrates the need to create closer and sincere cooperation, reciprocity and mutual action relations between the nations, for the promotion of peace and the reinforcement of security and stability.

Additionally, the multidimensional nature of future threats and challenges demonstrate the need for the countries to have flexible, well trained and properly equipped forces, able to develop quickly in strategic ranges. However, especially in times of reducing resources and budgets, the rationalization of defense expenses, through the prioritization of our requirements and needs, should be ensured so that the resources available will be exploited in the most efficient and productive way.

(Opening Remarks by the Chief of the Hellenic National Defense General Staff General Ioannis Giagkos in ‘Athena ‘11’ Crisis Management International Conference [1 June 2011]).

The Hellenic Navy operates in the framework of the United Nations Organization, NATO, European Union, and Organization for Security and Cooperation in Europe and participates in a number of international missions. Resource Teams of the Hellenic Navy Logistics Command confront the challenge of managing resources rapidly and cost effectively in an increasingly uncertain environment. When the complexity of the tasks can be completed only by the combined efforts of multiple individuals working together, where a breadth and depth of skills and expertise is required and when there is high interdependence among the task components, teams are the ideal unit of performance.

3. FOCUS ORGANIZATION

In this study, the examined organization is the Hellenic Navy Supply Center (HNSC), the primary logistic center of the Hellenic Navy (HN) that is responsible for the support of ships and shore units of the HN, during war and peace time, supplying parts and other items in order to keep them operational. The Hellenic Navy Supply Center employs approximately 500 people organized in nine major Departments (e.g., procurement, inventory control), subsequently divided into Divisions of five to ten persons for each category of item (e.g., general, electronics).

a. History

The Hellenic Navy Supply Center was founded in 1966 after a series of studies to address weaknesses in the Hellenic Navy Supply System, such as the fragmentation of the supply system and the independent divisional administrations of the executive branches of the Hellenic Navy General Staff (http://www.hellenicnavy.gr/kefn_en.asp). The organization of Hellenic Navy Supply Center was created based on the Inventory Control Points of the U.S. Navy and gradually adjusted and keeps adjusting for modern data and requirements .

b. Mission Statement

The Hellenic Navy Supply Center's mission is the implementation of the supply program of the Hellenic Navy. Financial support and policy direction is given by the Hellenic Navy General Staff. The Supply Center reports to the Hellenic Navy Logistics Command, which supports all Naval Units and activities of the Hellenic Navy (Hellenic Navy General Staff , 2007).

c. Structure

The Commanding Officer of the Hellenic Navy Supply Center is a Commodore (Financial and Supply Corps), who is responsible to the Hellenic Navy Logistics Command for the accomplishment of the Hellenic Navy Supply Center's mission statement. The Deputy Commanding Officer is the assistant of the Commanding Officer in fulfilling the above mission. As shown in Figure 1, the Hellenic Navy Supply Center is composed of nine (9) Directorates. These are:

- Coordination and Logistics Administration Directorate (1100)
- Inventory Control and Replenishment Directorate (1200)
- Procurement Directorate (1300)
- Receiving and Distribution Directorate (1400)
- Technical Support Directorate (1500)
- Automated Data Processing Center (1600)
- Marketing and Construction of Spare Parts in Domestic Market Directorate (1700)
- Supply Directorate of Salamis Naval Dock (1800)
- Supply Directorate of Crete Naval Dock (1900)

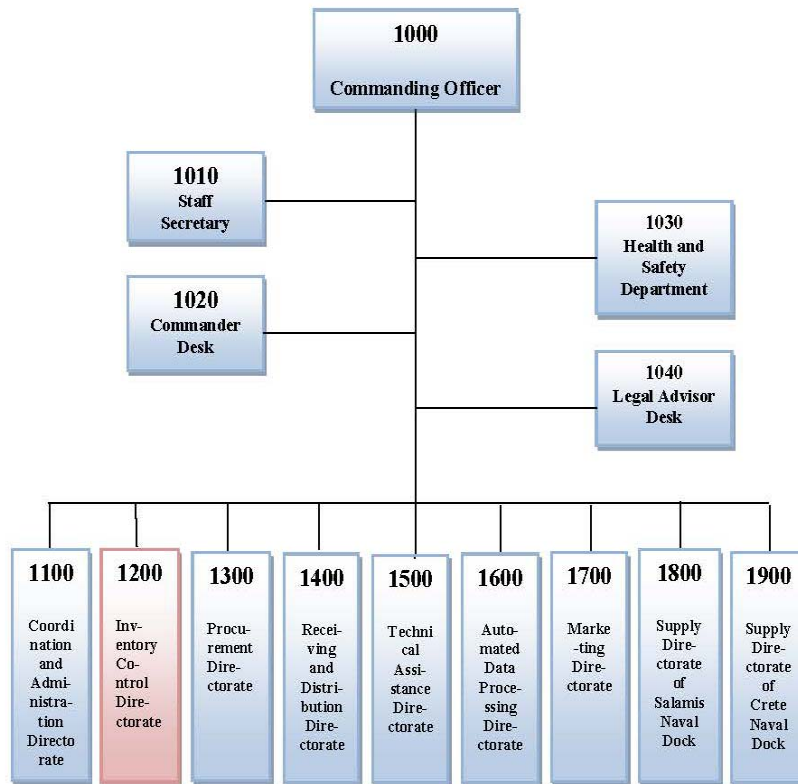


Figure 1. Hellenic Navy Supply Center Organizational Chart (From Hellenic Navy General Staff, 2007)

d. Tasks

The Hellenic Navy Supply Center is responsible for the fulfillment of a plethora of tasks that include: (1) inventory management of more than 500,000 items, spare and repair parts, (2) procurement of supplies equipment, machinery, and tools as well as the delegation to the private sector for all services needed, (3) dispatch and retrieval of equipment from/to foreign or domestic cities/countries, (4) management of the Hellenic Navy Supply Center's budget, (5) configuration management of all Naval Ships of the Hellenic Navy, (6) marketing surveys as well as the provision of all necessary assistance to local businesses towards the maintenance of a viable Greek industrial base, and (7) application of software development and maintenance for financial and supply support of naval ships and activities.

4. TEAM WORK IN THE HELLENIC NAVY SUPPLY CENTER

The concept of team as the preferred organizational unit exists in all three levels – top, middle and tactical – of management in Hellenic Navy Supply Center. Resources management decisions are made from higher management (Peripheral Advisory Committee), middle management (Directorates) and tactical management (Departments). The level of authority is defined in a significant degree by the nature of the procurement and the total cost of the purchased items. This project examines how current teams such as the Peripheral Advisory Committee and the Special Projects Department may improve their performance and how the team model can be used in other fields or sectors inside the HNSC.

a. Peripheral Advisory Committee

The Peripheral Advisory Committee plays a key role in the operations of the HNSC since it is the instrument that defines the ways in which the procurement processes are executed (Hellenic Navy Supply Center , 2011). This resource team consists of seven members: the Supply Center's Deputy Commanding Officer as Chairman and the Directors of Inventory Control and Replenishment Directorate (1200), Procurement Directorate (1300), Receiving and Distribution Directorate (1400), the Automated Data Processing Directorate (1600) and Financial Services Directorate as members. The Financial Services Directorate is not an operating Directorate inside HNSC; it falls under the Dockyard of Salamis and serves as a coordinating instrument of all the Dockyard's acquisition processes. The Peripheral Advisory Committee examines the following issues:

1. Approves the purpose and defines the process of realizing a procurement, contract, and task
2. Approves or cancels the results of a competition or a negotiation referring to the realization of a procurement, contract and task
3. Is responsible for the term modification of a contract

4. Has the ability to prefer a more expensive offer due to the advanced quality of the purchased product or service or the more advantageous terms of the contract
5. Can decide the termination of a contract
6. Is responsible for the special contracts and agreements between the Hellenic Navy and the foreign countries, international organizations, public entities, and legal persons governed by private law referring to the procurement of materials and supplies or the provision of services (Hellenic Navy Supply Center, 2011).

The Peripheral Advisory Committee was chosen as an example for illustrating team principles. It has team attributes such as the small number, complementary members' skills, shared purpose, specific goals, mutual accountability and common working approach that make it an organizational unit where the team concept can be applied. It is also a cross functional team given its composition. Examining how the team members can achieve continuous improvement and deliver better outcomes is part of the project.

b. Special Projects Department of the Inventory Control and Stock Replenishment Directorate

One of the starting points of this research is the Special Project Department that belongs to the Inventory Control and Stock Replenishment Directorate (1200). The Director of the Inventory Control and Stock Replenishment Directorate (1200) is responsible for the inventory and financial management of secondary items, the distribution of the spare and repair parts at the Naval Bases, the dispensation of data to the Procurement Directorate and the financial approval to Naval Ships or Activities in order to purchase supplies needed (Hellenic Navy General Staff, 2007).

The Special Projects Department was chosen as the second focus for illustrating team concepts. The Department is comprised by a fixed number Supply Officers and Petty Officers specialized in acquisition processes. The high interdependency of the Special Projects Department with other Departments inside the

Directorate makes it a good starting point for analyzing the team concept. To fulfill its mission the Department performs a variety of complex tasks that demand the coordinated effort of multiple individuals inside the Hellenic Naval Supply Center. More specifically, the Special Projects Department:

1. Monitors the work in progress of the two basic Maintenance Programs of the Hellenic Navy: the three-year Maintenance Program of the General Staff and the quarterly Maintenance Programs of the Commands. The Department is constantly updated on the Maintenance Programs undertaken by the Dockyards, as a response to the limited or the longtime immobility of their ships
2. Composes, coordinates and monitors the Program of Modernization and Development of the Hellenic Navy and the five-year Program of the National Infrastructure Projects.
3. Collects and processes the data referring to the necessary maintenance parts and is responsible for the timely provision of the above parts, in the appropriate quantities. To achieve this task, the Special Projects Department:
 - (a) Cooperates with the designated Department inside the Directorate (1200) according to the nature of the needed spare part.
 - (b) Compiles the Tables of the spare parts needed for the Maintenance Programs and transmits them to the Automated Data Processing Directorate for further processing.
 - (c) Cooperates with the Automated Data Processing Center Directorate to have full knowledge of the statistical data referring to maintenance materials used in the past for similar maintenance programs, and for similar types of systems or ships. It is responsible for the allocation of resources needed for the Maintenance Programs.
4. Is responsible for the incorporation of the new Units by the Logistics System of the Hellenic Navy, therefore:
 - (a) Cooperates with the Directorates of the Hellenic Navy Supply Center to achieve the correct, fast and timely incorporation of the new Units.

- (b) Defines the materials needed for the initial operating stage of the Hellenic Navy's Units, designs the acquisition process of these materials and ensures the continuous logistic support of the Units.
- 5. Undertakes every Special Program relevant to the tasks performed by the Directorate (1200).

The breadth and depth of skill, the required expertise and the high interdependence among the task components, make the concept of teamwork ideal for the Special Projects Department. The findings of this project might provide useful insights on how teamwork inside the Special Projects Department can become more effective and team performance can be improved (Hellenic Navy General Staff, 2007).

B. PRACTICES USED BY THE U.S. MILITARY

The Hellenic Navy Supply Center is committed to excellence and continuously seeks to improve its performance by implementing the best practices in managing resources. The United States Military is a leading-edge organization that delivers world-class standards of performance to its customers (Smith, 1999). Examining the practices used by the Resource Teams of the United States Military can provide a useful insight and a base of comparison to the Hellenic Navy.

The ultimate goal of Department of Defense (DoD) acquisition is to provide the war fighters with world-class equipment and systems at an affordable cost and on a schedule that is responsive to clear needs (Department of Defense, 1996). Several efforts, such as the Federal Acquisition Streamlining Act of 1994, allowed DoD to explore innovative, team-focused acquisition procedures implemented successfully by leading commercial firms (Department of Defense, 1996).

The following section describes two organizational units of the U.S. Navy that implement the team concept in managing resources. These are the Surface Warfare Enterprise (SWE) and the Integrated Product (Process) Teams (IPT's). SWE has important core team elements. First, the background of SWE is discussed and then the use of the team approach to achieve Enterprise objectives is described. IPT's serve as a

model to implement large scale change using a team-based redesign. This part, presents the challenges of organizational change, the expected benefits and the modifications for improved outcomes when using IPT's.

1. IMPLEMENTING THE ENTERPRISE CONCEPT IN THE MILITARY ENVIRONMENT

a. Background

The U.S. Navy is operating in a complex and challenging environment, conducting a vast variety of operations worldwide (Castle & Massie, 2010). The need to recapitalize the force structure while maintaining or improving fleet readiness in an environment of limited budgets has led the U.S. Navy to adopt a new management model: the Navy Enterprise construct (RAND National Defense Research Institute, 2009). More specifically, Navy Enterprise seeks to gain an improved return on investments through improved resource allocation and increases in output over cost (Buss, 2008).

The U.S. Navy needed to institute long-term behavioral and cultural changes that transformed the way it did business as a whole; therefore, Navy Enterprise is not only an organizational structure; it is a way of doing business, a behavioral model (RAND National Defense Research Institute, 2009). Figure 2 illustrates the goals of the large-scale change of business culture in the U.S. Navy (Castle & Massie, 2010). Surface Warfare Enterprise (SWE) focuses on quality improvement and on developing a culture more accepting of change. Cost awareness, collaboration and accountability are some of the critical features of the new structure. The enterprise approach empowers stakeholders across multiple commands to take a holistic view of objectives and processes, eliminating stove-pipes (RAND National Defense Research Institute, 2009).



Figure 2. Institute Behavioral and Cultural Change (From: Castle and Massie, 2010, p. 2)

b. Surface Warfare Enterprise

“The SWE provide us tools to improve processes, execute streamlined business practices and gain effectiveness throughout our Navy to produce war fighting effectiveness.”

—VADM D. C. Curtis, CNSF SWE 2010 Strategic Plan

SWE is an organizational construct that uses an enterprise approach to align numerous organizations within the surface community in order to function as a single entity. Its goal is to supply the right force of surface warships, at the right level of readiness, and at the right time. The enterprise addresses manning, maintenance, and material concerns related to surface warships, amphibious landing crafts (LCU, LCAC) and their crews (Castle & Massie, 2010).

SWE is not a command. Instead, it is an organizational instrument that provides the many organizations in the surface community a forum to address and solve issues that otherwise could not be effectively done without cross-organization

collaboration (Department of Defense, 1996). From this forum, SWE is able to set surface navy priorities and influence the allocation of resources.

c. SWE Mission – Objectives

“I don’t want to turn the Navy into a business, but we need to understand the business of the Navy”

—ADM Gary Roughhead, CNO USN

The enterprise concept is rooted in industry; however, the implementation of the concepts differs due to the uniqueness of the military environment (RAND National Defense Research Institute, 2009). The primary objective of the Enterprise is to establish teamwork among the partners to continually improve and produce innovative enterprise solutions; it also seeks to provide a challenging and rewarding environment that embraces diversity and personal growth as essential components in the way of doing business.

The SWE strategic plan for fiscal (FY) 2011 (SWE Strategic Plan, 2008) describes the following six objectives with associated initiatives:

- Produce prescribed levels of war-fighting readiness, based upon Fleet Forces Command defined demand signals
- Deliver and retain a diverse mix of the right people (officers, enlisted, civilians and contractors) with the required competencies and proficiencies—in the right place, at the right time, for the right value—balancing cost and readiness, while adhering to the SWE values
- Establish a “strategic financial management process” that enables the SWE to more effectively allocate and manage its financial resources to support current readiness and future capabilities
- Implement standardized cost management processes and financial metrics to drive increased productivity (readiness/cost)
- Lower total ownership costs across the SWE
- Improve enterprise maturity and execute with strategic financial management, increasing transparency and trust between enterprise partners.

d. Organization and Alignment

Figure 3 shows the current SWE organizational structure. It is comprised of a surface board with a ten-member senior executive committee (EXCOMM). The surface board is supported by five Cross Functional Teams (CFT) that report to the Surface Board via the SWE Deputy (SWE, 2008). The five CFTs include:

- Future Capabilities Team (FCT) that focuses on the delivery of affordable and effective capabilities that are appropriate for meeting a broad array of future challenges
- Future Readiness Team (FRT) that focuses on the optimization of support processes to deliver the required current and future readiness
- Personnel Readiness Team (PRT) that focuses on delivering and retaining a diverse mix of officers, enlisted, civilians, and contractors with the right competencies and proficiencies
- Strategic Financial Management Team (SFMT) that has the objective of making and influencing effective financial policy, management, stewardship, and program decisions
- Current Readiness Team (CRT) that focuses on the current readiness of surface force manning, training, and equipment issues (Castle & Massie, 2010).

There are also three additional teams that provide support across the five CFTs. These are the following:

- Overarching Metrics Team (OMT) that provides consistent, replicable, and integrated SWE performance measures in a standard format to help support the Surface Board decision-making process.
- Strategic Communications Team (SCT) that centralizes and prioritizes communication tasks and goals through long-term planning and utilizations of communication tools.
- Surface Team One (ST1) that focuses on improving cross-organizational maintenance processes in order to maintain and modernize the surface navy, meet expected ship service life, and address current material readiness challenges (Castle & Massie 2010).

These teams are developed as multi-disciplinary from the stakeholder commands and are mandated to focus on collaboration across each CFT, vice operation within specific stovepipe duties and responsibilities (Castle & Massie, 2010). Through this style of management, SWE is able to remove barriers within the organization and incorporate the right people into the decision-making process. CFTs are put together with personnel (military and civilian) from stakeholder commands to improve and manage the key processes related to the focus area of that specific team.

Each team has the capacity to set up a Barrier Removal Team (BRT) (Castle & Massie, 2010). These teams are temporary in nature and stood up for the removal of a specific barrier(s) once it has been identified. They are authorized to accomplish their given task then demobilize.



Figure 3. SWE Structure as of 2010 (From: Williams & Konner, 2010, p. 38)

2. NAVAIR INTEGRATED PRODUCT (PROCESS) TEAMS – TEAM BASED REDESIGN AS A LARGE-SCALE CHANGE

a. Background

“I am directing a fundamental change in the way the Department acquires goods and services. The concepts of IPPD and IPTs shall be applied throughout the acquisition process to the maximum extent practicable.”

—William Perry Secretary of Defense

On 10 May 1995, Secretary of Defense William Perry issued a Memorandum (Secretary of Defense, 1995) to the Service Secretaries requiring the use of Integrated Program Teams or Integrated Product Teams (IPTs) “throughout the acquisition process to the maximum extent practicable.”

The DoD has worked to find the best methods for reengineering its processes. Several studies have addressed the benefits of using Integrated Product and Process Development (IPPD) (Department of Defense, 1996). IPPD has its roots in integrated design and production practices, concurrent engineering, and total quality management and has been successfully used by the private sector and by the Services on selected programs to reduce product cost and to field products sooner. At the core of IPPD implementation are Integrated Product Teams (IPTs) that organize for, and accomplish, tasks that acquire goods and services. These multifunctional teams are the foundation of the process.

b. Definition of Integrated Product and Process Development (IPPD)

DoD defines IPPD as, “A management process that integrates all activities from product concept through production/field support, using a multifunctional team, to simultaneously optimize the product and its manufacturing and sustainment processes to meet cost and performance objectives” (Department of Defense, 1996, p.3). Di Trapani and Geithner (1996) suggest that IPTs are set up to foster parallel rather than sequential decisions and to guarantee that all aspects of the product, process, or policy are considered throughout the development process.

IPTs are mandated by DoD Directive 5000.1 (p.5) and DoD Directive 5000.2 (p.62) to “function in a spirit of teamwork with participants empowered and authorized, to the maximum extent possible, to make commitments for the organization, working together to built successful programs.” As a result, overall program performance can be maximized, rather than performance of individual function areas.

The Guide to successful IPTs (Department of Defense, 1996) underlines the following tenets as factors of effective IPPD implementation: customer focus, concurrent development of products and processes, early and continuous life cycle planning, maximization of flexibility for optimization and use of contractor approaches, encouragement of robust design and improved process capability, event-driven scheduling, multidisciplinary teamwork, empowerment, and proactive identification and management of risk.

As shown in Figure 4, the focal point of IPPD activities is customer satisfaction, which is translated (using military terms) to the user’s satisfaction. Resources applied include people, processes, money, tools, and facilities.

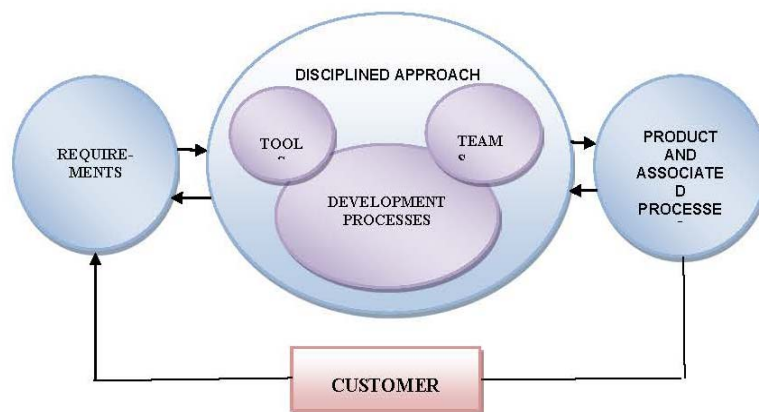


Figure 4. A Generic IPPD Iterative Process (From: DoD Guide to Integrated Product and Process Development, p. 1-3.)

c. Purpose of IPPD

In 1995, during the DoD Conference “Institutilizing Integrated Product Teams: DoD’s Commitment to change” Noel Longuemare, Principal Deputy Undersecretary of Defense, stated that IPTs were created to “improve program success rates, do the right thing on time, and do them right the first time.” They also “move away from hierarchy, improve efficiency and take advantage of all knowledge.” IPTs are the key device through which Program Managers are responsible for all aspects of life-cycle management for their assigned system. The scope of this responsibility clearly includes the programming, budgeting and execution of acquisition and in-service support.

d. The Challenge of Organizational Change

Di Trapani and Geithner (1996) underline that IPTs need strong high-level and middle management support and continual reinforcement to succeed. This is justified by the fact that IPTs require changes to structures, policies, process and even philosophy. If these occur, they believe that teaming will become a way of life for an organization in 3 to 5 years. Otherwise, teams are condemned to lose their effectiveness.

e. Lessons Learned from High-performance IPTs

The experience to date with the IPT concept suggests a few common characteristics of successful IPTs (Department of Defense, 1999). According to the Guide for Leading Successful Integrated Product Team, issued by the DoD, each team should have clearly defined roles and responsibilities, product interfaces, decision authority and resources with which to execute its task. The establishment of metrics appropriate to task and measurements of processes are essential features for the team function. Furthermore, processes for conflict resolution should be established at the start of the effort, and contentious issues raised and addressed early.

Members should respect the views and contributions of others, and accomplish their objectives through continuous team building. Team members should be well-trained technical experts empowered to represent their respective competencies. Using their expertise, members should recognize that they are collectively and

individually accountable for their products (Department of Defense, 1999). Internal and external reporting relationships and processes should be established to keep all the involved stakeholders and customers informed of status, progress and issues.

The key to achieving high-performance IPT operations is thorough program planning, proper allocation of resources, availability of efficient processes, and most of all training of the team members. These are mutual responsibilities of the PMAs and the competency leadership.

f. Expectations, Risks and Modifications For Improved Outcomes

If organizations and their IPTs have all (or most) of these features, we can expect the following outcomes (Di Trapani & Geithner, 1996):

- Higher upfront costs, primarily due to the need for training, collocating IPTs, and more frequent meetings
- Better communication
- A higher-quality workforce as individuals become exposed to the broad program picture
- more informed decisions and less time overall because of faster high-level review and approval

The DoD Guide to Integrated Product and Process Development underlines that the primary benefits of IPPD are reduced cost and schedule while maintaining quality and, essentially, a more balanced tradeoff among cost, schedule and performance (Department of Defense, 1996).

Di Trapani and Geithner (1996) suggest that there are, however, a number of potential risks managers must consider when setting-up IPTs:

- IPTs have high “upfront” costs. If offsetting cost and time savings do not materialize, there are few remedies and little time to recover.
- Teams can start behaving like committees if individuals put their interests of their functional specialty above the interests of the teams

- IPT structures, with overarching, integrating, and working level IPTs, can become over-bureaucratized and top heavy, slowing down or hindering progress rather than facilitating
- Over time, the continued reassignment of functional specialists to integrated teams can dilute core functional skills, resulting in the loss of “corporate memory”

Hocevar and Owen (1998) identify specific areas within the three domains of structure, processes and culture of IPPD processes and IPT performance that need management attention. These are the following:

(1) Structure

To manage the potential for overuse of teams, a critical analysis of tasks and processes should be done. Teams should be used only in situations of high routine or non-routine interdependence (Hocevar & Owen, 1998). Teams should be limited to effective decision making and problem solving. Structural mechanisms that encourage lateral (rather than hierarchical) integration will optimize expedient information processing and reduce the unnecessary “oversight.”

(2) Process

Team-based design demands the implementation of new processes that include information exchange and decision making. To acquire the required level of knowledge team members must receive proper training. A charter that specifies the levels of authority for each member and describes the decision making processes facilitates the distinction between positional authority and administrative responsibility. The clarification of roles and responsibilities sets the boundaries between the leadership roles and the functions necessary for team effectiveness (Hocevar & Owen, 1998).

(3) Culture

The core of empowered teams in effective team-based organizations is distributed leadership. According to the DoD Guide to Integrated Product and Process Development: “DoD must shift from an environment of regulation and enforcement to one of incentivized performance” (Department of Defense, 1996, p. 3–5).

The key to success, however, is not the superficial adoption of participative management's values. Teams need to be given the appropriate training, information, performance feedback, and decision authority for self leadership (Hocevar & Owen, 1998).

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III. LITERATURE REVIEW – AN OVERVIEW OF TEAMS

A. INTRODUCTION

This chapter presents the theoretical background information from the literature related to team effectiveness. Its purpose is to build the model to assess team effectiveness that will be used to organize the content of the project. First, the definition of the term team is given. Then the team's key characteristics and development stages are discussed. The reasons that a team is the ideal organizational unit are analyzed. A review of team effectiveness models is conducted and representative models are provided. Finally, a model to assess team effectiveness; organized in three perspectives is developed.

B. WHAT IS A TEAM AND WHEN ARE THEY APPROPRIATE

1. Team definition

In 2004, Katzenbach and Smith stated that teams will become the primary unit of performance in high-performance organizations. They argued that every company faces specific performance challenges for which teams are the most practical and powerful vehicle at top management's disposal. The critical role for senior managers is to recognize a team's unique potential to deliver results, deploy teams strategically when they are the best tool for the job, and foster the basic discipline of teams that will make them effective.

The complexities of the military environment, the plethora of tasks, the demand for coordinated action that yields high-performance results and the notion of common purpose and commitment make the use of team as the basic unit of performance irreplaceable. Teams in the military setting are often called on to perform stressful, hazardous tasks that require coordination, shared responsibility, complementary skills and commitment to a common approach (Salas, 1997). Furthermore, many team tasks have in common the characteristic of being dynamic—requiring team members to harness resources and adapt quickly to changing conditions. Adaptability, flexibility and

implicit coordination are fundamental requirements of the Hellenic Navy Logistics Command's mission; therefore, team structure can offer a key for successful results.

People use the word *team* in a rather loose manner and certainly a group does not automatically become a team only because that is what someone calls it. So, what is a team?

Polzer (Polzer, 2003) defines a team as having:

- A clear team task, one that requires multiple people to work together interdependently to achieve collective outcome
- Clear boundaries distinguishing those who belong to the team from others
- The authority of those on the team to manage their own work process
- Some stability that allows team members to work together over time.

Katzenbach and Smith (1993) believe that teams outperform individuals when performance requires multiple skills, judgments and experiences. According to them, the truly committed team is the most productive performance unit management has at its disposal. The authors develop the following essential discipline-definition that if applied will produce both team and performance:

A team is a small number of people with complementary skills who are committed to a common purpose, performance goals, and approach for which they hold themselves mutually accountable. (Katzenbach and Smith, 1993, p.45)

At the heart of this definition of team lies the premise that a team can provide a mechanism for pursuing a demanding performance challenge. McShane and Von Glinow (2007) underlined teams' perceptions of themselves as social entities within organizations. Similarly, Katzenbach and Smith (1993) identify common purpose and approach, shared commitment and mutual accountability as critical team characteristics. According to Hocevar and Owen (1998), teams provide optimal structure value if they are strategically positioned where there is substantial non-routine task interdependence and at critical decision points that have historically slowed cycle time.

2. Team development stages

The research shows that teams tend to develop through four separate, sequential stages (Cameron & Whetten, 2005). These four stages, originally defined by Tuckman (1965) are forming, norming, storming and performing. To transform from an aggregation of individuals sharing a common setting to a highly effective team, the team must pass through these four phases of development. As teams develop they often cycle back through these stages. Thus, the order of storming and norming is sometimes reversed. The authors identify the following characteristics for every stage:

a. The Forming Stage

This is a period of testing and orientation during which the members get acquainted, explore the team purposes and boundaries and evaluate the costs and benefits of continued membership (McShane & VonGlinow, 2007). Clarity of direction is needed from team leaders while relationships are formed and trust is established (Cameron & Whetten, 2005).

b. The Norming Stage

The team is faced with creating cohesion and unity, differentiating roles, identifying expectations for members and enhancing commitment (Cameron & Whetten, 2005). Team leaders need to provide supportive feedback and foster commitment to a vision.

c. The Storming Stage

The team is faced with disagreements, counter dependence and the need to manage conflicts as team members compete for team roles. Challenges include violations of team norms and expectations and overcoming groupthink (Cameron & Whetten, 2005). The members try to establish norms of appropriate behavior and performance standards (McShane & VonGlinow, 2007).

d. The Performing Stage

The team members are committed and task oriented. High-performance teams have a high level of trust, identify with the team, foster continuous improvement and capitalize on core competencies. To maintain high-performance, leaders need to support implementation of team ideas, product or recommendations (Cameron & Whetten, 2005).

3. The supremacy of teams

Not all groups are teams (Katzenbach & Smith, 2004). Teams produce discrete work-products through the joint contributions of their members. This is what makes possible performance levels greater than the sum of the individual bests of team members. Table 1 depicts the differences between working groups and teams that include: the approach in leadership, the mentality (individuality versus collectivity) in accountability and work products, and the orientation of tasks (broader for groups—more specific for teams).

Table 1. Not All Groups are Teams: How to Tell the Difference. (From: Katzenbach and Smith, 2004, p. 6)

Working Group	Team
Strong, clearly focused leader	Shared leadership roles
Individual accountability	Individual and mutual accountability
The group's purpose is the same as the broader organizational mission	Specific team purpose that the team itself delivers
Individual work-products	Collective work-products
Runs efficient meetings	Encourages open-ended discussion and active problem solving meetings
Measures the effectiveness indirectly by its influence on others (e.g., financial performance of the business)	Measures performance directly by assessing collective work-products
Discusses, decides and delegates	Discusses, decides, and does real work together

Teams have a history and a future (Brannick & Prince, 1997). Groups are usually brought together for a specific purpose and disbanded when the task is achieved. McShane and Von Glinow (2009) suggest that teams are usually better suited to work that is sufficiently complex, such as designing a building or auditing a company's financial records. Under these circumstances, the necessary knowledge skills are not typically found within one person, the work is performed more efficiently by dividing its tasks into more specialized roles and people in those specialized roles require frequent coordination with each other.

Katzenbach and Smith (1993) believe that real teams, not just groups, should be the organizational basic unit of performance for most organizations regardless of size. In any situation requiring the real-time combination of multiple skills, experiences and judgments a team inevitably gets better results than a collection of individuals operating within confined job roles and responsibilities. Teams are more flexible than other organizational groupings because they can be more quickly assembled, deployed, refocused and disbanded, usually in ways that enhance rather than disrupt more permanent structures and processes. Teams are more productive than groups that have no clear shared performance objectives because their members are committed to delivering tangible performance results. Katzenbach and Smith underline that teams and performance are an unbeatable combination.

The record of team performance speaks for itself. Teams invariably contribute significant achievements in business, government, communities and, of course, in the military (Cameron & Whetten, 2005). The Coalition's dramatic Desert Storm victory over Iraq in the Gulf War involved many teams. A team of active duty officers and reservists, for example, lay at the heart of moving, receiving and sustaining over 300,000 troops and 10,000 vehicles with more than 7,000,000 tons of equipment, fuel and supplies from the late 1990 build up to after the end of hostilities in 1991 (Cameron & Whetten, 2005).

Table 2 reports the positive relationships between employee involvement in teams and several dimensions of organizational and worker effectiveness such as productivity, quality and morale (Lawler, Mohrman & Ledford, 1995).

Table 2. Impact of Involvement in Teams on Organizations and Workers. (From: Lawler, Mohrman & Ledford, 1992, p. 450)

Impact of Involvement in Teams on Organizations and Workers	
Performance Criteria Improvement	Percentage Indicating
Changed management style to more participatory	78
Improved organizational process and procedures	75
Improved management decision making	69
Increased employee trust in management	66
Improved implementation of technology	60
Elimination of layers of management supervision	50
Improved Safety and health	48
Improved union-management relations	47
Quality of products and services	70
Customer service	67
Worker satisfaction	66
Employee quality of work life	63
Productivity	61
Competitiveness	50
Profitability	45
Absenteeism	23
Turnover	22

According to the data presented in Table 2, organizations that actively used teams significantly improved their performance in areas such as organizational processes and quality of products and services when compared to organizations where teams were infrequently used. Possessing the ability to lead and manage teams has become a commonplace requirement in most organizations. Management consultant Tom Peters expresses eloquently the power of team-working:

Are there any limits to the use of teams? Can we find places or circumstances where a team structure doesn't make sense? Answer: No, as far as I can determine. That's equivocal and meant to be. Some situations may seem to lend themselves more to team-based management than others. Nonetheless, I observe that the power of the team is so great that it is often wise to violate apparent common sense and force a team structure on almost anything. (Cameron & Whetten, 2005, p. 449)

C. REVIEW OF TEAM EFFECTIVENESS MODELS

Even though the research literature on teams is vast, a universally accepted model of team effectiveness does not exist. The majority of the models adopt the three stage "Input-Process- Output" (IPO) architecture. Some of the models focus on aspects or variables that are internal to the team, whereas others focus more on external factors (e.g., contextual and situational factors) that impact on the achievement of the goals (RTO NATO, 2005). The review highlighted a number of situational factors, certain team functions and individual characteristics that influence team effectiveness. The special demands of the military environment however require a model that presents its dynamic and adaptive characteristics and contains typical factors for the military teams such as the mission statement and the after-action review.

1. Cohen and Bailey (1997)

After an extensive research that included 200 articles from the business, psychological and current contents indexes Cohen and Bailey (1997) presented a heuristic framework of team effectiveness. Their systems framework uses the 'Input-Process-Output' approach to depict the complexity of relationships and suggests that critical group processes occur both inside and outside of the group.

Inputs include task design, group composition, organizational context and environmental factors. Some of the task design factors are interdependence and autonomy while group composition design variables include size, tenure, demographics and diversity; all of which are elements that influence performance. Examples of the organizational context design parameters are rewards, supervision, training, and resources and environmental factors refer to industry characteristics and degree of turbulence. Processes include internal processes, external processes and shared psychological traits.

Examples of internal and external processes are communication and conflict; while group psychosocial traits refer to shared understanding, norms, cohesiveness, and emotional tone. According to the authors, the outputs of effective teams are divided into performance outcomes, attitudinal outcomes, and behavioral outcomes. Indicators of high performance are improved quality and productivity, while positive attitudinal and behavioral outcomes are connected with high job satisfaction and trust and low turnover and absenteeism.

The model underlines the importance of a team's shared psychological traits (group beliefs, understanding and emotional tone) and their influence on behavior. The combination of design factors, environmental factors, internal and external processes, and group psychological traits predict effectiveness outcomes (Cohen & Bailey, 1997).

2. NATO Research and Technology Organization: Review of Team Effectiveness Models (2005)

The increasing demand for multinational, joint operations has made the research on team effectiveness in the military setting even more intense (RTO NATO 2005). To support commanders achieve the highest team effectiveness at operational and tactical levels NATO Research and Technology Organization (RTO NATO) conducted a review of the most known models of team effectiveness. They assessed the models' strengths and weaknesses and their applicability in the military environment (RTO NATO 2005). Among the examined models are:

- The Driskel, Salas and Hogan model (1987)
- The Salas, Dickinson, Converse, and Tannenbaum model (1992)
- The Tannenbaum, Beard, and Salas model (1992)
- The Cannon-Bowers, Tannenbaum, Salas, and Volpe model (1995)
- The Klimoski and Jones model (1995)
- The Shanahan model (2001)
- The Rasker, van Vliet, van den Broek, and Essens model (2001)
- The Blendell, Henderson, Molloy, and Pascual model (2001)

The models reviewed differ in their focus (e.g., internal or external factors that influence performance) and approach (e.g., structural relationships among factors or dynamic temporal relations). The RTO NATO (2005) review suggests that the Input, Processes, Outputs (IPO) concept used by the majority of the models, analyzes critical characteristics of team effectiveness and may serve as a useful framework to improve command teams performance. As depicted by several models, knowledge, skills, attitudes (KSAs) and leadership are two of the elements that affect significantly team effectiveness. The special demands of the military environment require a model that will present the dynamic and adaptive characteristics of the military environment. The authors suggest that the models need to contain typical factors for the command teams such as the mission statement and the after action review. According to them, the model that concentrates the desired, specific components of team effectiveness is the Tannenbaum, Beard, and Salas model (1992).

Tannenbaum et.al model adopts the Input, Throughput and Output structure, includes general situational and organizational characteristics such as rewards, resources and climate, and incorporates feedback loops. The authors identify four high-level input variables (Task, Individual and Team Characteristics, and Work Structure). Within task characteristics, task organization, type and complexity are related to task performance. The team's work structure refer to parameters that can influence the team processes such as the differences in the way work is assigned to the team, the formal communication structure of the group and the team norms. Tannenbaum et al. (1992) identify individual characteristics such as task proficiency, abilities and skills, and personality variables (sociability, adjustment and likeability) as input variables that affect significantly the team's performance. The last cluster of input variables includes team characteristics such as power distribution, team resources, homogeneity, cohesiveness and team climate.

The throughput phase, which incorporates the team processes and the team interventions, is the second phase of the systems model. According to Tannenbaum et al. (1992) the team processes that influence team performance are: communication, conflict resolve, decision-making, problem solving, and action co-ordination. Team interventions encompass individual and team training and team building.

The final systems component proposed by Tannenbaum et al. (1992) is the outputs which includes team changes (e.g., new roles, change in cohesion); team performance (quantity and quality of products and services, as well as time, errors, cost and overall productivity); and individual changes (e.g., enhanced skills, change in attitudes and motivation). The key advantages of the model proposed by Tannenbaum et al. include the emphasis on the context of the team and the dynamic aspects of team functioning

3. McShane and VonGlinow (2007)

McShane and VonGlinow (2007) model follows the systems triptych “Input-Process-Output.” Organizational and team environment represent the inputs, team design and team processes refer to the processes while team effectiveness is defined as the team’s output. Team design includes parameters than influence team performance such as task characteristics, team size and team composition. Team processes refer to team development, team norms, team cohesiveness and team trust.

According to authors team effectiveness has three major components. These are high performance, high job satisfaction and high ability to survive. In effective teams the members have the ability to deliver the desired results, ensuring high quality and productivity. Furthermore, team members are motivated to stay in the team because their needs are fulfilled and the working conditions are satisfying. Finally, successful teams have the ability to maintain their members by providing them adequate resources and by developing a high level of commitment.

D. PROPOSED FRAMEWORK OF TEAM EFFECTIVENESS

The model presented below (see Figure 5) is an integration of the systems models discussed in the literature review and follows the pattern inputs-throughputs-outputs. It offers a model of team effectiveness that can potentially help teams in Hellenic Navy and is used to organize the remainder of this Project. The term inputs may infer that task characteristics and individual, team and environmental conditions are static. In fact, these components are dynamic and change continually. The framework presents several

process factors such as the roles and responsibilities, procedures, relationships and leadership that impact team effectiveness. The outcomes are organized in three categories: attitudinal (individual), behavioral (team) and performance. The next chapter explains the details of the model.

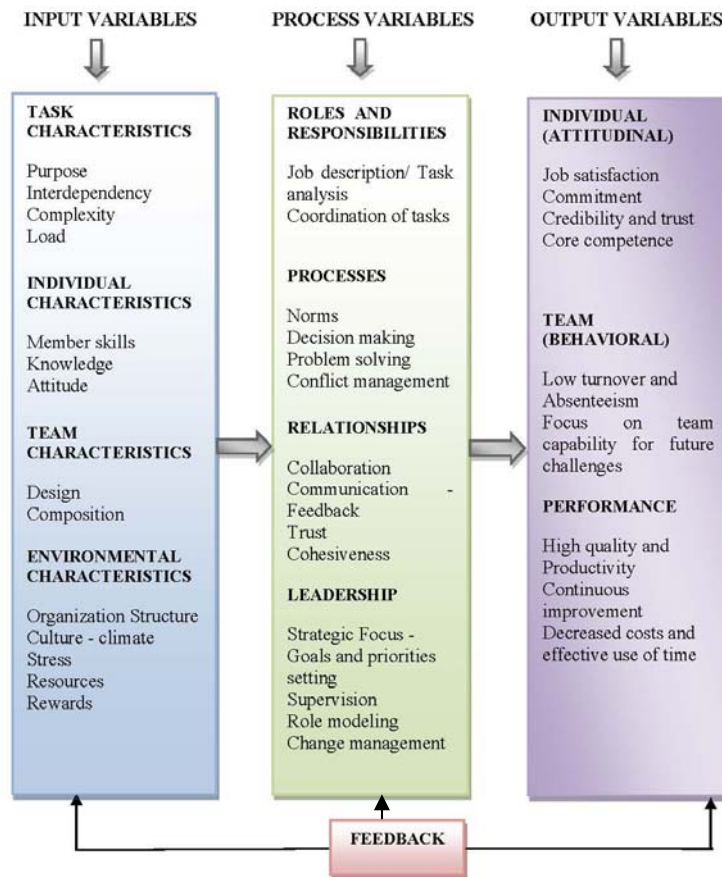


Figure 5. Team Effectiveness Model (After: Katzenbach & Smith [1993]; Cohen and Bailey [1997]; Tannenbaum, Beard & Salas [1992]; and McShane & VonGlinow [200])

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IV. LITERATURE REVIEW: DETERMINANTS, PROCESSES AND DESIGN OF HIGH PERFORMANCE TEAMS

A. INTRODUCTION

This chapter analyzes the key attributes of high performance teams. It is structured following the systems model developed in the previous chapter (see Figure 5) and presents supporting literature for each element of that model. It discusses the input variables of the model which include task characteristics, individual characteristics, team characteristics and environment characteristics and explains how these inputs affect performance. Then the process variables and their influence on team effectiveness are identified. These include roles and responsibilities, team processes, relationships between team members, and leadership. Output variables consists the third level of analysis where the individual (attitudinal), team (behavioral) and performance characteristics of successful teams are presented. The second part of this chapter analyzes the need to monitor and measure team performance and provides a diagnostic mechanism to assess team effectiveness.

B. KEY ATTRIBUTES OF HIGH PERFORMANCE TEAMS

1. INPUT VARIABLES

Inputs refer to the task characteristics, individual characteristics, team characteristics and environment characteristics. The purpose, interdependency, complexity and load of the teamwork are task elements that define the selection of the team as the ideal performance unit. After deciding that the team is the appropriate unit to perform the assigned tasks, selecting the right team members comes next. Criteria in this decision are the individual attributes of the team members which include knowledge, skills and attitudes. Team characteristics such as design and composition define the optimal number of team members and indicate the accepted degree of heterogeneity. Team structure, climate, rewards system and resources are environmental factors that influence the team's efforts.

a. Task Characteristics

Team members are motivated to work better when their tasks are interesting, meaningful and challenging (Wheelan, 1999). Current literature suggests that there is a positive relationship between task characteristics and team processes, which in turn influence performance outcomes (Toquam, Macaulay, Westra, Fujita and Murphy, 1997). The most important task characteristics are purpose, interdependency and complexity.

(1) Purpose

Team tasks must be clearly linked to team purpose and goals. Similarly team purpose and goals must be linked to larger organizational missions, goals and strategies (Scholtes, Joiner and Streibel, 2000). This provides the team with a “bigger picture” mission so that they understand how their work fits into a larger purpose (Polzer, 2003). Tasks with a well-defined purpose provide the team focus and direction.

(2) Interdependency

Polzer defines task interdependency as the situation where the work can be completed only by the combined efforts of multiple individuals working together (Polzer, 2003). Assessing the degree of task interdependency is essential to determine whether team is the optimal unit to perform the work at hand. The greater the level of interdependency between the task components, the more appropriate is the use of team to perform the task. Task design structures may vary in their communication and coordination requirements. Dickinson (1969) argues that tasks with high interdependency and coordination demand well-developed communication networks.

(3) Complexity

High task complexity, according to Polzer, requires breadth and depth of skills and expertise— people from multiple disciplines must coordinate their efforts to perform the task. Dickinson defines task structure as involving interdependency, complexity and work coordination (Dickinson, 1969). The cooperative conduct is stronger when the task design increases in complexity, has many decomposable parts, and involves personnel with complementary skills (Young, 2003).

Wood and Bandura (1989) argue that there is a curvilinear relationship between task complexity and performance: as complexity increases performance first increases as interest and motivation increase and then performance decreases as capacity is rising. As long as the completion of the task dictates more expertise than one person can provide, the team concept is the most appropriate mechanism.

(4) Load

Bowers, Braun and Morgan (1997) define workload as “the relationship between the finite performance capacities of a team and the demands placed on the team by its performance environment.” Processing a large amount of information and dealing with a plethora of subtasks are features of task load. The heavier the workload, the more people are needed to perform it and therefore the more appropriate the team is. Generally, team coordination and effective performance is negatively affected when the workload demands exceed the team’s ability to fulfill them (Bowers, Braun & Morgan, 1997).

b. Individual Characteristics

Individual-level factors represent the characteristics and dispositions that each team member carries into the group process. Task requirements define the choices regarding team composition (Hackman & Morris, 1975). In this project, individual characteristics are presented under the triptych: Knowledge- Skills-Attitudes (KSAs) (Cannon-Bowers, Tannenbaum, Salas & Volpe, 1995) with knowledge including the principles and concepts of effective task performance and skills and attitudes referring to the specific attributes needed to meet the task requirements and behaviors that foster effective team performance. Klimoski and Jones (1995) suggest that choosing team members on the individual task KSAs alone is not enough to ensure optimal effectiveness. Research literature suggests that organizations focused on educating and training people about both the technical aspects of their job and effective group participation will increase the likelihood of those organizational groups to become high-performance teams (Wheelan, 1999).

As Table 3 illustrates, teams require a wide range of knowledge, skills and attitudes competencies (KSAs) to work effectively. Some of these KSAs are detailed below.

Table 3. Team member competencies (After: Cannon-Bowers et al., 1995)

Knowledge	Skills	Attitudes
Cue/strategy associations	Adaptability-flexibility dynamic reallocation of function	Team orientation
Task-specific teammate characteristics	Shared situational awareness	Conflictive efficacy
Shared task models	Mutual performance monitoring and feedback self-correction	Shared vision
Knowledge of team's mission, objectives, norms	Leadership/team management conflict resolution assertiveness	Team cohesion
Task sequencing	Coordinating task integration	Interpersonal relations
Accurate task models	Communication	Mutual trust
Accurate problem models	Decision making problem solving meta cognition	Task specific teamwork attitudes
Team role interaction patterns		Collective orientation
Understanding team work skills		Importance of teamwork
Knowledge of boundary spanning roles		
Teammate characteristics		

(1) Skills

The more holistic nature of the work in teams (to include planning, control and coordination, instead of just doing the work) (Harris & Beyerlein, 2003) requires team members with a broad set of skills. Katzenbach argues that the extra performance capacity that a team provides comes largely from a complementary mixing

of its members' skills. As a result, team members should be selected on the basis of the set of skills they will bring to the group (Katzenbach 1998).

As mentioned above, determining the different ways the task can be divided is the criterion in determining the specialized skills required for the people who perform each component (Polzer, 2003). Teams must develop the right mix of skills; that is, each of the complementary skills to do the team's job. Katzenbach and Smith divide skill requirements into three categories: technical or functional expertise, problem solving and decision-making skills, and interpersonal skills. Literature suggests that managers tend to focus their attention on technical skills when selecting their team. Polzer, however argues that the lack of interpersonal skills may hinder productivity and that interpersonal skills such as openness to new ideas, supportiveness, action orientation and a positive style are essential components of effective teamwork.

As stated in the literature review, it is difficult to find teams that concentrate all the needed skills at their outset. Nevertheless, team is a vehicle for personal learning and development and as long as the potential exists, the dynamics of team cause that skill to develop (Katzenbach & Smith, 1993).

(2) Knowledge

Cannon- Bowers et al. argue that the following knowledge competencies are necessary for teams to perform effectively: accurate, shared mental models; understanding of the nature of teamwork and teamwork skills; knowledge of overall team goals, objectives and missions; knowledge about boundary spanning; and knowledge about fellow members' roles and responsibilities (Cannon-Bowers, Tannenbaum, Salas & Volpe, 1995). The concept of mental models is based on their ability to provide to team members a set of organized expectations about team behavior. Team members must have knowledge about teammate characteristics (competence, preferences, strengths and weaknesses), team norms, mission, objectives and resources to formulate their expectations.

Furthermore, the team needs to have common task models and a thorough understanding of the mechanisms and procedures for task accomplishment.

Finally, the team members must have knowledge on how the team fits into the organization, the interactions between the organization units and the alignment between the team's tasks and the organization's mission. The preexisting knowledge about team roles, relationships and team overall mechanisms of team performance helps the team to cope with a demanding task (Cannon-Bowers, Tannenbaum, Salas & Volpe, 1995).

(3) Attitudes

Several studies have shown that individuals' attitudes significantly influence team performance. Dick and Carey (1990) define attitude as an internal parameter that influences individuals' choices or decisions to act in a certain way under particular circumstances. Attitudes that help an individual to flourish in the team setting include collective orientation, collective efficacy cohesion, mutual trust, and shared vision (Cannon-Bowers, Tannenbaum, Salas & Volpe, 1995).

The collective orientation endorses the team concept and suggests that the team's goals are above the individual's goals. Driskell and Salas' (1992) research on two-person teams indicate that the egocentric teams performed no better than their members as individuals, while collectively oriented teams outperform individual members. Collective efficacy refers to the perception of the collective success of the group and the members' confidence about the task-specific ability of the team. Cohesion effects team morale and both influence members staying in the group (Festinger, Schachter & Back, 1950). Mutual trust connotes an atmosphere that facilitates the free expression of opinions and ideas, mutual respect among the team members and innovative proactive behavior. Shared vision refers to commonly held attitudes regarding the direction, mission and goals of the team (Vaziri, Lee and Kriger 1988). Research conducted by Tjosvold and Tsao (1989) shows that shared vision contributes to effective collaboration, commitment and productivity.

c. Team Characteristics

Establishing the right "mix" of personnel for effective team performance goes beyond the individual level. Design and composition are some of the team characteristics that can influence team effectiveness.

(1) Design

According to Polzer, a lot of money and effort can be saved by defining timely (pre-launch) and accurately the contextual and structural dimensions of the team (Polzer 2003). Diagnosing the task characteristics, securing the provision of the essential resources and selecting the right people for the right job are parts of the team-designing process.

Determining whether or not a team is the appropriate management unit to perform the task is a crucial initial step. To accomplish this, managers need to examine thoroughly the task's objectives, complexity and interdependence. As mentioned above, when the task is complex and requires a variety of skills and significant coordination, team is the optimal mechanism. Establishing the team environment is the next step of team design. This entails the clear definition of leaders' and members' roles and responsibilities and the establishment of processes to promote effective interactions (e.g., rewards system).

(2) Composition

The most important step in team composition is the selection of the right members. First, the optimal team size has to be established. The literature suggests that the most desirable team size is approximately five to seven members (Varney, 1989; McShane & VonGlinow 2007). Essentially, the type of task will define the optimal team size (Cannon-Bowers & Bowers, in press).

Finding the individuals with the right mix of technical and interpersonal skills comes is a crucial step in organizing an effective team. The appropriate levels of diversity need to be ascertained and the formal roles of team members and leadership have to be clarified. The degree of similarity or dissimilarity among group members is indicated by homogeneity or heterogeneity (Toquam, Macaulay, Westra, Fujita & Murphy, 1997).

The research shows that diversity of personal traits and attitudes affects positively team performance in situations involving complex problems that demand innovative solutions (McShane & VonGlinow, 2007). The different

backgrounds, the broader knowledge base and the better representation of a team's constituents contribute to team effectiveness. When heterogeneous teams' members are properly trained and are familiar with the task they perform better than homogeneous teams (Triandis, Hall & Ewen 1965). Nevertheless, the research indicates that homogeneous groups with a high score on certain personal characteristics (e.g., need for achievement, task orientation) perform more effectively than heterogeneous groups on these same variables. Furthermore, heterogeneous teams need more time to achieve high performance and are more susceptible to "faultiness"—the split of the group into subgroups along cultural, gender, professional and other dimensions (McShane & VonGlinow, 2007). Finally, the larger the percentage of new members in an existing group, the more resistance there will be to their assimilation (Varney, 1989) and the more difficult their role coordination.

d. Environment Characteristics

Organizations and teams do not function in a closed system (Kraiger & Wenzel, 1997). The current organizational environment is characterized by increased complexity, continuous change, globalization, and need for adaptation (Harris & Beyerlein, 2003). The social, political and economic dimensions of culture affect the behaviors, cognitions and attitudes of the team members inside the organization (Triandis, 1988). Matching the organizational logic to the environment and the tasks is a central principle of organizational design. Hence, organizational structure, culture, climate, stress, resources and rewards are some of the main environmental characteristics that influence team performance.

(1) Organizational Structure

Beyerlein and Harris (2003) suggest that the environment of teams is critical to their performance; thus, designing the whole organization to support teams makes effectiveness possible at the lower levels. The optimization of collaborative capacity is possible only when the teams are aligned with the organizational context and systems. As stated by Dumaine (1994):

When the teams are introduced as an isolated practice, they fail. My gut feeling is most are introduced in isolation... And time and time again teams fall short on their promise because companies don't know how to make them work together with other teams. (pp. 86–92)

The term “team-based organization” (TBO) refers to an organization that uses teams as its building blocks and is designed to support teams. The concept of TBO is based in the following principles (Harris & Beyerlein, 2003): (1) teams are the formal organizing unit of accountability and work, (2) teams are used only when it is appropriate, (3) teams are led by teams, (4) an array of teams is used, (5) TBO is a continuous process, (6) the organization is designed to support teams, (7) the organization is designed with flexibility and adaptability, (8) alignment is the key that holds organizational parts together, (9) organization leaders must have a TBO-compatible philosophy, (10) TBO requires intentional effort. It is evident that TBO represents a radical change from the traditional organizational design; that is why it requires substantial investment and effort (Harris & Beyerlein, 2003).

(2) Culture-Climate

Most scholars agree that organizational culture consists of the values, basic underlying assumptions, and informal norms shared within an organization (Harris & Beyerlein, 2003; McShane & Von Glinow 2009). Culture is the cohesive element that enables coordination of activity. A team-oriented culture creates an environment where team members work in a way that promotes collaboration in problem solving. Fostering a climate favorable to marginalized voices enhances critical reflection, exploration and reconstructing and provides true value to diversity (Coleman and Voronov, n.d.).

(3) Stress

Morgan and Bowers (1995) define teamwork stress as: the stimuli or conditions that directly affect the team members' ability to interact interdependently and alter the team's interactive capacity for obtaining its desired objectives. These stimuli and conditions have direct influence on team coordination, interaction and information sharing. Stress factors that can affect team performance include, among others, team work load, team size, team composition, team structure, and team cohesion. Increased

team workload, large team size, heterogeneity and lack of conformity may lead to inferior decision making and poor performance. Table 4 presents the hypothesized effects of stressors in team decision making.

(4) Resources

The balance of team resources with the task demands is the equation that optimizes team performance (Bowers, Braun & Morgan, 1997). Generally, an abundance of resources (e.g., money, information) promotes team effectiveness. Young (2003) however, argues that there is a positive relationship between resource scarcity and goal association with others. When the task accomplishment demands the integration of critical resources from multiple contributors, the cooperative conduct is more intense (Kessler & Chakrabarti, 1996). In this way, individuals share the cost of these resources with others and apply more effectively all required resources for the task.

(5) Rewards

Literature on teams suggests that the team reward structure influences behaviors and attitudes in organizations (Lawler, 1986; Weiner, 1980). Managers are often faced with the dilemma of establishing a reward system at the level of the individual contribution or the team outcome (Polzer, 2003). The level of award interdependence influences significantly the collaborative efforts of the team members. When the rewards system is individually oriented, members have a strong incentive to improve their individual performance, but they might do it at the expense of the team's goals. A team incentive-oriented reward system promotes greater teamwork and reinforces the importance of team effort (Kraiger & Wenzel, 1997). Nevertheless, when the collective rewards are shared equally among the members, there is the danger of free riding or social loafing. These phenomena disrupt team effectiveness. However, if rewards are linked both to team and individual performance, the benefits of teaming are reinforced and the risks of free riding and social loafing are reduced.

2. PROCESS VARIABLES

Processes are the essential activities performed by the team members with the purpose to accomplish team goals (Cannon-Bowers & Bowers, in press). Processes include such things as assignment of roles and responsibilities, team procedures, relationships among team members, and leadership.

a. Roles and Responsibilities

Roles are defined as “a set of behaviors that people are expected to perform because they hold certain positions in team and organization” (McShane & VonGlinow, 2007, p.330). Role assignment is an important team process that facilitates the team members to achieve their goals and maintain the team relationships. Clear roles and responsibilities are essential design features of effective teams (Larson & LaFasto, 1989). At the outset of the team, the roles, the responsibilities and the relationships between the members must be defined. More specifically, members should have a clear understanding of their individual accountabilities and the results expected from them. The research of Larson and LaFasto indicates that in successful teams “everyone is accountable all the time.”

Roles, tasks and responsibilities must be consistent with each other and designed in a manner that promotes supportive attitudes and reinforces cooperation. The team members faced with ambiguous roles and challenging tasks develop positive dependence when they share information, exchange ideas and provide feedback (Tjosvold, 1986). Job description, coordination of tasks and qualification are three key elements of team design.

Accountability enhances overall performance. The assignment of clear roles, tasks and responsibilities to team members and the monitoring of the results make each member accountable for the achievement of the team’s objectives. As stated above, one of the leader’s responsibilities is the creation of an atmosphere of consistent accountability. The continuous feedback on performance and the institution of a rigorous peer evaluation process facilitate team members to meet their commitments. Larson and

LaFasto (2001) notice that team member become more productive when the standard: “We are all accountable for results” (p.130) is consistently applied to all members.

(1) Job Description/Task Analysis

As stated above, complex and difficult tasks that demand a collaborative approach are particularly suited for teams. Faced with a task that requires frequent interaction and joint contribution, the members realize that they can be effective only if everyone is effective (Tjosvold, 1986). Establishing the job requirements for the team is an essential step for its successful performance. Typically, the job description/task analysis process is individually rather than team oriented.

Burke (2004) suggests the following basic steps in conducting the task analysis : First, the requirements have to be analyzed with the intention to describe accurately the job in order for the team to be trained and to clarify any redundancies or omissions. This step allows the correction of any discrepancies in the tasks’ and procedures’ description and can be achieved with the use of various methods (e.g., interviews, observations, surveys). Then, the targeted tasks and the chosen approach of their accomplishment are identified. The third step includes the taxonomy of the specific teamwork requirements. The coordination analysis that describes the teamwork requirements follows. At this point, the conditions and standards associated with teamwork across organizational tasks should be built into the job/task analysis. Translating the tasks into KSAs or competencies is the next step—job/task analysis procedures should explicitly include team-level KSAs. Finally, the team tasks have to be linked with the team’s KSAs in order to confirm the task analysis outcome.

(2) Coordination

Bowers, Braun and Morgan (1997) argue that coordination is a critical characteristic of efficient teams and provide the following definition: “*Coordination is the simultaneous and orderly action of several individuals in the performance of certain complex tasks*” (Bowers, Braun & Morgan, 1997, p.89). Coordination entails the organization of the team’s tasks and the distribution of the necessary resources among the team members in order to fulfill these tasks. The most significant parameter of coordination is communication. Exchanging information to

identify and solve problems, discussing ideas to create the best solution to the problem, and demonstrating teamwork by following procedures and instructions from superiors are ways to promote coordination (Tjosvold, 1995).

b. Processes

Procedures are not factors that members bring to the team; instead, they emerge out of team interaction. These include the establishment of norms, decision making-problem solving processes, conflict management, and performance evaluation.

(1) Norms Establishment

Team norms are the informal rules of contact and the shared expectations that regulate teamwork and personal interactions (Klimoski and Jones 1995). Norms reveal the team history as well as the predominant team values. They are evident at the outset of the team and provide direction on how the team members are expected to behave. Norms' formation can be influenced by critical past events, the values that members bring to the team or even subtle events (e.g., type of greeting, place that each member sits) (McShane & VonGlinow, 2007).

Norms are difficult to change; therefore, they must be established during the formation of the group. Furthermore, to maintain the desired norms team leaders should select members who already have the appropriate values. McShane and VonGlinow (2007) argue that the more an individual's identity is connected with the team, the easier their behavior will align with the team's values. For instance, if the team is innovation oriented, one of the criteria of a member's selection is their ability to think "outside of the box." Leaders have the responsibility to enhance the desirable norms and subdue the dysfunctional norms. Coaching and team-based reward systems can be used by leaders to promote the desirable team norms. According to Wheelan (1999), successful teams establish norms that promote high performance, quality and success. Shared expectations for success and norms that encourage innovation and freedom of expression significantly increase team effectiveness and productivity.

(2) Decision-Making/Problem-solving

Decision-making is a critical element of team performance and refers to the process of making conscious choices among alternatives with the intention to achieve the desired outcomes (Shull, Dellbecq & Cummings, 1970). Guzzo (1995) defines decision-making as the sum of activities that refer to gathering, interpreting and exchanging of information, creation of alternatives, selection of the best alternatives, implementation of the optimal solution and monitoring of the consequences. The ambiguity that often characterizes team interactions makes decision-making a challenging process that demands the integration of different perspectives and opinions. Team decision-making is a multilevel phenomenon that combines individual and team processes.

McShane and VonGlinow (2007) acknowledge that teams can face several concerns in the process of problem solving and decision-making because they represent different constituent points of view. For example, team members from a given stakeholder perspective may frame the situation in such a way that tends to short-circuit the decision makers' assessment or limit their appreciation of different alternatives. Their perceptual defenses may inhibit useful information exchange, and their mental models may prevent new ideas.

The amount of time spent in the decision making phase and the level of members' participation influences the quality of the outcome and the overall team effectiveness (Wheelan, 1999). People generally make more effective choices by evaluating the alternatives, anticipating emergencies and thinking how to react to the future environments (McShane & VonGlinow, 2007). Furthermore, scenario planning is a useful instrument that helps the team prepare for the future without the pressure and emotions that accompany real emergencies.

(3) Conflict Management

Organizations are living entities that demand non-static relationships. The dynamic interactions between team members with different values, perceptions, goals and priorities can lead to conflict (McShane & VonGlinow, 2007). McShane and VonGlinow define conflict as a process in which one party perceives that its interests are being opposed or negatively affected by another party. According to them

some of the common sources of conflict in teams are incompatible goals, different beliefs, interdependence, scarce resources, ambiguous roles and poor communication.

Past perspectives of conflict indicated that it is connected with lower job satisfaction, team cohesion and information sharing (Jehn & Bendersky, 2003). The current perspective, however argues that moderate conflict improves decision-making, helps team members become more responsive to their external environment and potentially increases cohesion inside the team (McShane & VonGlinow, 2007). The diversity of viewpoints and the elaboration of the ideas challenged increases creativity and leads teams to better decisions (Scholtes, Joiner & Streibel, 2000). When the team members' experience too much value cohesiveness, similarity and high level of agreement about critical information exchange, "groupthink" may occur which lowers team effectiveness. The ability to manage conflict is a critical team-level skill (Cannon-Bowers & Bowers, in press). The presence of preventative behaviors, such as standard operating procedures for managing stress, seems to have a positive effect on teamwork behaviors and has been associated with effective performance.

c. Relationships

Research shows that team members who develop positive work interactions are more effective in jobs requiring emotional labor, make better decisions involving social exchanges and are superior leaders (McShane & VonGlinow, 2007). Relationships management demands high levels of self-awareness, self-management and social awareness and includes a variety of practices. Some of these practices are: supporting a collaborative climate, building trust and cohesiveness and facilitating effective communication.

(1) Collaboration

"Working well together" is a fundamental characteristic of effective teams (Larson & LaFasto, 1989). Larson and LaFasto argue that collaboration is the essence of teamwork. In their research, they reach the following conclusions: (1) there is a positive relationship between high performance and collaboration, (2) low

performance or ineffective teams are associated with competitive climates and the pursuit of individual objectives at the expense of the team's objectives.

According to them, collaboration flourishes in a climate of trust—a climate that is characterized by honesty, openness, consistency and respect. More specifically, an environment that enables members to express freely their thoughts and concerns and address and resolve the real issues enhances the collaborative approach. Collaboration is feasible when team members have the opportunity to get involved and are given autonomy. Weiss' (1999) research in workplace conditions suggests that a culture that supports collaboration and team members' participation in decision-making is positively related to high morale, commitment and lower turnover. Leaders who make team communication safe, demand from the team members the adoption of a collaborative approach, reward collaborative behavior and create a work environment that promotes productive problem-solving, contribute to an open and supportive team environment.

(2) Communication

Effective communication is a significant factor to the team's success because it mainstreams the mission, strategic priorities and core values of the organization (LaFasto & Larson, 2001). Communication includes timely dissemination of information, free flow of information and the establishment of a communication system inside the team. The process by which information is transmitted and understood between team members is vital to team effectiveness. Larson and LaFasto underline the importance of an effective communication system and identify four major elements:

- Information is easily accessible
- Information merges from credible sources. The credibility of sources affects the quality of decisions and the team members' participation in the decision-making and problem solving processes.
- Team members can raise issues not included in the formal agenda. The opportunity to discuss issues beyond the formal frame enhances team cohesiveness.

- Issues raised and decisions made are documented. Documentation prevents ambiguity and duplication of effort (Larson & LaFasto, 1989).

Effective communication entails the participation of all the team members and needs to happen in all directions. The leader of the team has to communicate clearly the mission and the priorities of the team by using a variety of media in order to avoid misinterpretations. To get the message across, the leader should empathize with the receiver—be sensitive to the team member’s feeling and thoughts, repeat the message, choose an appropriate time for the conversation and be descriptive (McShane & VonGlinow, 2007). Successful communication supports work coordination, decision-making, and employee wellbeing.

(3) Trust

The empirical research supports that trust is a critical relational dimension to the formation of cooperation within groups and organizations. By definition, “trust is the degree to which the trustor holds a positive attitude toward the trustee’s goodwill and reliability in a risky exchange situation” (Das & Teng, 1998, p.498). Williams (2001) identifies trust as an enabler of cooperative conduct, and Badaracco (1991) says that it is an indispensable attribute to the success of alliances. Trust influences interpersonal proximity, value incentives and the motivation to cooperate (Nahapiet & Ghoshal, 1998). Individuals are more inclined to engage in proximal relationships when they feel that their assets are not at risk in the presence of another party. This positive psychological orientation enhances reciprocity because individuals do not fear that their vulnerabilities will be exploited (Young, 2003). Dirks and Ferrin (2002) found a positive relationship between trust and organizational citizenship behavior. Altruism, helping specific persons, generalized compliance and following the rules of the system are some of the expressions of citizenship behavior (Dunne and Barnes, 2003). Trust between the team members enables cooperative behaviors and offers performance advantages (Dyer & Singh, 1998). A competitive and individually oriented environment tends to inhibit trust while the opposite occurs in cooperative situations (Johnson & Noonan, 1972).

(4) Cohesiveness

High-cohesion team members are committed to the team's goals and adopt a collective approach in order to fulfill them (McShane & VonGlinow, 2007). Gammage et al. define team cohesion as “a dynamic process that is reflected in the tendency for a group to stick together and remain united in the pursuit of its instrumental objectives and/or the satisfaction of member affective needs” (Gammage, Carron, Estabrooks, 2001, p.5). In cohesive teams, members perceive team as part of their identity; therefore, they are motivated to maintain their membership. The most significant factors of team cohesiveness are:

- Similarity of the members. People with similar background, values and philosophy on life tend to feel more comfortable with each other and built more cohesive teams.
- Size of the team. Teams with a small—yet adequate—number of members tend to be more cohesive.
- Interaction among the members. Fairly regular interaction strengthens the team's cohesiveness.
- Barriers to entry. The more challenging is the entrance to the team, the more the members value their membership.
- Success of the team. Members attach their identity to teams that fulfill their needs and goals. Therefore, successful teams increase cohesiveness.
- External competition and challenges. A threatening situation that demands unified commitment and collaborative approach tightens the bonds between the team members (McShane & VonGlinow, 2007)

Team cohesion facilitates the information exchange and enhances team satisfaction. McShane and VonGlinow suggest that high-cohesive teams perform better than low-cohesive teams because they achieve better cooperation between the members and more conformity to the norms.

d. Leadership

The leadership role is instrumental in the creation and maintenance of effective teams and can add significant value in any collective effort (Wheelan, 1999) (Larson & LaFasto, 1989). The concepts of the command-and-control boss and the front-and-center charismatic hero belong to the past (McShane & VonGlinow, 2007). A current definition provided by McShane and VonGlinow after research with 54 leadership experts from 38 countries describes leadership as “influencing, motivating, and enabling others toward the effectiveness and success of the organizations of which they are members” (p. 231).

To gain the team members’ respect, a team leader has to be effective and produce results. This does not necessarily mean that leaders must possess all the required skills. Wheelan suggests that the average person of goodwill that possesses some basic skills and flexibility has the potential to become an effective leader. The recent leadership literature identifies several leadership competencies. These include emotional intelligence, integrity, drive, leadership motivation, self-confidence, intelligence and knowledge of the business (McShane & VonGlinow, 2007). This project identifies the following four key elements of effective leadership:

(1) Strategic Focus – Goals and Priorities Setting

The first responsibility of the leader is to keep the team focused on its mission (LaFasto & Larson, 2001). Therefore, team leaders should be able to articulate clearly and communicate eloquently the significance of the team task (McIntyre & Salas, 1995). In this way, the team members will have a sense about the necessity of their participation and the importance of their assignment. By setting relevant goals and priorities, the leader enables the members to connect their contributions to the final desired objective

Effective team leaders have the ability to translate the mission achievement process into important objectives that will lead the team to the goal. The absence of ambiguity in articulating the critical team initiatives will save the team

valuable time and energy. Making sure that the team understands that priorities change and trying not to dilute the team's effort with too many priorities will make the collective effort work (LaFasto & Larson, 2001).

(2) Supervision – Performance Management

Team leaders set the standards of performance, introduce the most effective practices and constantly push team members to overcome inertia. Constant follow-up, low tolerance in the absence of the desired results, creation of consequences for failure and rewards for excellence may be used as leadership tactics to enhance team performance (Larson & LaFasto, 1989). Managing performance takes time since it entails the planning of a well-thought-out message, provision of feedback, creation of the action plan and enough time for progress to be observed (LaFasto & Larson, 2001).

The first responsibility of an effective leader is to make performance expectations clear. Specifying the team's objectives and facilitating the team members' translation of goals into meaningful initiatives and activities provides a clear focus and a coherent perspective to the team. Defining not only what to achieve but also how to achieve it is also a mandate for the leader (LaFasto & Larson, 2001). The leader establishes the collaborative approach as a requirement for success by holding each member accountable and by encouraging the team to agree on a set of values that guides their performance. To monitor the performance effectively, the leader should have a performance plan that will guide each member toward achieving results. Assessing the collaborative skills of team members as well as the results they achieve and ensuring rewards and incentives are aligned with achieving the team's goal are essential elements in managing performance. Finally, the leader's ability to give constructive feedback, confront and resolve performance issues and recognize and reward superior performance increases the team effectiveness.

To be successful, team leaders should be well prepared in terms of the technical aspects of the team task (McIntyre & Salas, 1995). Perfect knowledge of the assigned task details and overall competence enhances the leaders' security and

confidence in carrying out their role. This applies especially in new groups, where members expect leaders to be directive, confident, organized and task oriented (Wheelan, 1999).

(3) Role Modeling

Team leaders serve as models of teamwork for their fellow team members. That means that their attitude, for instance, towards monitoring and accepting or providing feedback will probably be adopted by the team members. The research conducted by McIntyre and Salas (1995) illustrates that the behavior of the leader influences certain types of team behavior such as back-up behavior. When the leader “helps everyone out,” this encourages helping behavior between team members. The leader’s openness to feedback from other team members who have special expertise or the acceptance of critique from junior members reveals the influence the team leader has on both monitoring and feedback (McIntyre & Salas, 1995)

(4) Change Management

When Nilekani and Darbee say that leadership “is about dreaming the impossible and helping followers achieve the same” they refer to the transformational leadership. Transformational leaders are essentially the people who challenge the status quo and create change. Bennis and Nanus argue that the effective leaders motivate people to act, convert followers into leaders and converts leaders into agents of change. Effective leaders have the ability to demonstrate to their team members that change is possible (Larson & LaFasto, 1989). The four consistent characteristics of transformational leadership are:

- Creating a strategic vision. A realistic and attractive future energizes and unifies team members. This shared strategic vision that may derive from team members, clients or other constituents, motivates the team members to strive for success.
- Communicating the vision. To be effective, the vision has to be clear and elevating; it must be articulated in a way that inspires passion and ommitment (LaFasto & Larson, 2001). To achieve this, the team leaders may use symbols, metaphors, stories and other vehicles that transcend plain language.

- Modeling the vision. Leaders do not just talk about the vision; they enact it. Kotter observes that effective leaders focus on (1) having an intelligent agenda for change and (2) building a strong, energized network of necessary resources.
- Building commitment toward the vision. The team members' willingness to commit time and effort, to work hard and to do whatever is necessary to achieve the goal are the distinguishing factors of high-performance teams (Larson & LaFasto, 1989). Change cannot be achieved without the team members' unified commitment. Leaders' persistence and consistency facilitates members to stay on course. Soliciting the members' energetic participation in shaping the team's vision enhances their commitment to change.

3. OUTPUT VARIABLES

Outputs include team performance as well as other outcomes such as job satisfaction, turnover and continuous improvement. In this project, output variables are divided into three categories: attitudinal (individual), behavioral, and performance.

a. Attitudinal (Individual)

Attitudinal variables refer to changes at the individual level and include job satisfaction, commitment, credibility and trust, and core competence.

(1) Job Satisfaction

Factors that influence job satisfaction include the perceived job characteristics (e.g., autonomy, meaningfulness), the emotional experiences at work and the working environment. Is "a happy worker a productive worker"? The latest evidence in the Organizational Behavior field reveals a moderate relationship between job satisfaction and performance (McShane & VonGlinow, 2007). A supportive environment, which provides incentives to the team members to excel and recognizes their individual contribution to the team effort, promotes job satisfaction.

(2) Commitment

Commitment is a critical component of the team's success and refers to the member's emotional attachment to, identification with, and involvement in the team. Committed members are less likely to be absent from work or quit their jobs. McShane and VonGlinow state that loyal team members tend to have higher motivation, team citizenship and job performance. High level of cohesiveness, trust, justice and support and the presence of strong, shared values increase the individual commitment to the team.

(3) Credibility and Trust

Individual credibility and trust are enhanced when the member works in a team environment that facilitates the free expression of opinions and ideas and mutual respect. Fukuyama (2000) underlines the centrality of honest and cooperative behavior in building trust and the emerging "transaction costs" when trust is absent. According to him, low-trust teams have to undertake the additional burden of litigations, negotiations and enforcements that high-trust teams do not have to pay.

(4) Core Competence

Individual competence increases as the level of experience and the problem-solving ability of the member increases. A participative leadership style that actively involves team members in all the team processes facilitates individual development and productivity (Wheelan, 1999). Studies in team training have shown positive relationship between the designed intervention and the targeted competencies. For instance, team coordination and adaptation training has positive effect in adaptability, communication and coordination (Cannon-Bowers & Bowers, in press).

b. Behavioral

Behavioral variables include low turnover and absenteeism, innovative and effective problem solving, mutual trust and commitment and shared purpose.

(1) Low Turnover and Absenteeism

Retaining talented people is important for team sustenance. Along with retaining people with the right skills, teams need members who maintain their work attendance. In both cases, job satisfaction is one of the main causes. When the working conditions are dissatisfying and the working environment is stressful, team members are motivated to search for and join other teams or are more likely to be absent (McShane & VonGlinow, 2007).

(2) Team capability for future challenges

Team capabilities such as communication, conflict management, and effective problem solving can develop as members work together. These outcomes better prepare teams for future challenges. Also, team learning processes that allow spontaneity and creativity, cooperation and teamwork influence potential innovation (Edmondson, 2003). Common sense of purpose and approach enhance collective orientation, mutual trust, and commitment between team members and create the conditions for enhanced future capability. (Cannon-Bowers, Tannenbaum, Salas & Volpe, 1995; Katzenbach & Smith, 1993). Finally, leaders who provide positive and constructive reinforcement without intimidating the team fuel mutual accountability and confidence and facilitate team members to face successfully future challenges.

c. Performance

Performance variables refer to the core performance of the members and include high quality and productivity, continuous improvement, decreased cost and effective use of time.

(1) High Quality and Productivity

A rewarding team environment that provides to the members mutual assistance and support, accurate communication, confidence in new ideas and commitment to implementation has a wide range of beneficial effects (West, Tjosvold &

Smith, 2003). The combination of resources and ideas facilitates the team to produce value to satisfy its stakeholders. Essentially, true productivity increases when team members are capable of solving the real problems of the business (Camp, 1987).

(2) Continuous Improvement

Effective teams search continuously for the best practices and implement mechanisms for self-assessment and self-monitoring. Team members use feedback to improve their performance and are committed to excellence. An open communication structure that allows members to participate and utilize feedback about its effectiveness and productivity contributes to the continuous team improvement (Wheelan, 1999). Furthermore, team norms that promote innovation, success, quality and high performance help the team members to raise their standards. Critical to continuous improvement is a leadership that encourages excellence and recognizes and rewards superior performance.

(3) Decreased Cost and Effective Use of Time

McShane and VonGlinow underline that one of the most significant problems with teams is that they have additional costs. These costs are also stated as process losses and refer to resources such as time and energy that are expended during team development and maintenance. The expense of time and energy in team processes diverts resources from the accomplishment of the team's task. The problem is more intense when new members join the team because it takes time to learn how to coordinate efficiently with the rest of the team. As team dynamics evolve, members develop mutual understanding of their goals, the approach to accomplish these goals, their specific roles and responsibilities and the informal rules of conduct (McShane & VonGlinow, 2007).

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V. FINDINGS – RECOMMENDATIONS

This chapter presents the findings resulting from the analysis in Chapter II, III and IV. It presents the results of the project by answering the research questions posed in Chapter I. It then explains the limitations of this study. Lastly, it offers recommendations for further consideration under the topic of implementing the team concept in the Hellenic Navy Supply Center.

A. FINDINGS

Chapter I presented a primary project research objective of determining the characteristics, critical processes and key success factors of high performance teams. To achieve this objective, it proposed the following research questions:

- Is the team concept applicable to Resources Teams in the Hellenic Navy?

Resource teams of the Hellenic Navy operate in an environment of limited budgets and are directed to do more with less. The ongoing military operations and the substantially limited resources dictate that the Supply teams have to operate at the highest level of efficiency and effectiveness. Resource team exists in several sectors of the Hellenic Navy Logistics Command. The focus of this study was the Hellenic Navy Supply Center (HNSC), the primary logistic center of the Hellenic Navy. The plethora and the complexity of the tasks performed by the HNSC's Peripheral Advisory Committee and the interdependence among the team members working in the Special Projects Department make them the ideal starting points to implement the team concept analysis.

- What is the U.S. Navy team approach in Surface Warfare Enterprise (SWE) and in Integrated Product (Process) Teams (IPT's)? Which of them may be implemented by the Hellenic Navy Resource Teams?

United States (U.S.) Military is a leading-edge organization that delivers world-class standards of performance to its customers and has a long history of exploring innovative, team-focused acquisition procedures implemented successfully by leading commercial firms. Two of the best practices used by the U.S. Military to achieve

effectiveness are: the Surface Warfare Enterprise that applies the enterprise concept in the military environment and the NAVAIR's Integrated Product (Process) Teams that apply team based redesign as a large scale change.

SWE is an organizational instrument that provides the many organizations in the surface community a forum to address and solve issues that otherwise could not be effectively done without cross-organization collaboration (Department of Defense, 1996). The primary objective of the Enterprise is to establish teams among the partners to continually improve and produce innovative enterprise solutions. IPT's management process integrates all activities from product concept through production/field support, using a multifunctional team, to simultaneously optimize the product and its manufacturing and sustainment processes to meet cost and performance objectives. How these two practices can be transferred and implemented by the Hellenic Navy has not been answered in this project and can be the topic for further research.

- Why teams are appropriate?

The complexities of the military environment, the plethora of tasks, the demand for coordinated action that yields high-performance results and the notion of common purpose and commitment make the use of team as the basic unit of performance irreplaceable. Teams in the military setting are often called on to perform stressful, interdependent and hazardous tasks that require coordination, shared responsibility, complementary skills and commitment to a common approach (Salas, 1997). Furthermore, many team tasks have in common the characteristic of being dynamic—requiring team members to harness resources and adapt quickly to changing conditions. Adaptability, flexibility and implicit coordination are fundamental requirements of the Hellenic Navy Logistics Command's mission; therefore, team structure can offer a key for successful results.

- Based on the research on team effectiveness, what is the proposed model for enhancing team effectiveness in the Hellenic Navy Logistics Command?

The proposed model of team effectiveness presented in Chapter III is an adaptation of the models discussed in the literature review and follows the pattern inputs-throughputs-outputs. Inputs include task characteristics and individual, team and

environmental conditions. The framework presents several process factors such as the roles and responsibilities, processes, relationships and leadership that impact team effectiveness. The outcomes are organized in three categories: attitudinal (individual), behavioral (team) and performance.

- What are the determinants, design and processes of high-performance teams?

When the tasks are characterized by a high level of interdependency, complexity and load the team is the ideal organizational unit. Teamwork requires members who have the right mix of technical and social skills, knowledge of their tasks and positive attitudes. Determining whether the team is the appropriate organizational unit, defining timely the proper team design and the degree of member's similarity are necessary steps to insure effectiveness. A low to moderate stress environment that promotes collaboration provides the required resources to the team and rewards excellent performance enhances effectiveness.

When the members have a clear understanding of their roles and responsibilities, perform tasks that are relevant to their abilities and work in a coordinated way the accomplishment of the team's goal is easier. Positive norms, high participation in the decision making processes and a mechanism to manage conflict facilitate the team interactions. Open and sincere communication and a high level of trust and cohesiveness are practices that allow "working well together." The presence of a leader capable to motivate, inspire and serve as a role model for the teammates adds value to the collective effort.

In successful teams the members are satisfied from their job, are committed to the team effort, show high levels of credibility and trust and see the team as a vehicle to improve their core competences. Effective teams have low turnover and absenteeism and focus on how they can improve their problem solving ability and creativity. In this way they can achieve higher productivity, by delivering better quality services with reduced cost.

Managing Resource Teams in the Hellenic Navy has been and will remain a difficult task. Faced with an increasingly uncertain environment that demands the highest level of effectiveness and efficiency, managers and employees of the HNSC work hard to implement the supply program of the Hellenic Navy. These findings seek to ease their efforts.

B. LIMITATIONS OF STUDY

In conducting the research for this project, data were limited in scope due to constraints on distance. Key managers and employees at the HNSC who are deeply involved in team work processes can be selected for further interviews. Interviews with a large random sample size may produce broader results on which fields of the HNSC's activities the usage of teams is most appropriate.

C. RECOMMENDATIONS

1. Assessing team effectiveness

“How are we doing?” is a natural question for team members to ask. Measurement is critical to monitoring and assessing team effectiveness. It is an investment that provides valuable information to inform a decision or an action related to the skills certification of the team members, the team's development, the members' selection, team design, and organization support for team performance. The purpose of developing an assessment tool is the provision of problem diagnosis, the evaluation of the current practices used by the team as well as the determination of interventions to improve teamwork.

Evaluation is a challenging process that provides valuable guidance to the team. A starting point to assess team effectiveness is the team outcomes. Successful teams meet the organization's objectives, provide job satisfaction to their members and develop behaviors for improved, future team performance. Assessment has a diagnostic dimension, too. By examining the input factors and the process factors of the team systems model, the team can gather data to guide interventions to improve team performance. These interventions may refer to organizational support and organizational

design (Inputs) or to the team internally (Processes). The assessment questions can also act as a guide for the organization as they continue establishing new teams.

The Appendix presents a survey (checklist) to evaluate team performance based on the proposed framework of team effectiveness. As shown in Table 4 the questions of the checklist (in italics) match to the identified key attributes of high performance teams. It contains statements such as: “member assignments match their abilities,” “team has an open communication structure that allows all members to participate” and “team uses resources and time effectively” that correspond to the Inputs - Processes – Outputs team effectiveness scheme presented in Chapter 3. For instance Individual Characteristics are examined under the statements: “Members have the right mix of skills” and “Members have positive attitude.” The survey consists of twenty-five questions that can be answered with the following four keys: 1. Disagree strongly, 2. Disagree to some extent, 3. Agree to some extent 4. Agree strongly. By collating the individual member responses the team’s average score can be determined. The minimum score is twenty five points while the maximum score is one hundred points. Regardless of the score, the checklist’s purpose is to indicate the fields where a team can improve its performance.

This survey may be used by the HNSC as a tool to assess the level of effectiveness in the Supreme Advisory Committee and in the Special Projects Department or by Hellenic Navy in general wherever teams exist.

Table 4. Survey on team effectiveness: What makes a high performance team?

INPUTS	PROCESSES	OUTPUTS
TASK CHARACTERISTICS Purpose Interdependency Complexity Load <i>"Members are clear about team goals and their tasks"</i> <i>"Tasks require members to work together"</i>	ROLES AND RESPONSIBILITIES Job description/ Task analysis Coordination of tasks <i>"Team members are clear about their roles and responsibilities"</i> PROCESSES Norms Decision making Problem solving Conflict management <i>"Teams norms encourage innovative solutions"</i> <i>"Team implements its solutions and decisions"</i> <i>"Team uses effective decision making strategies"</i> <i>"Team uses effective conflict management strategies"</i>	INDIVIDUAL (ATTITUDINAL) Job satisfaction Commitment Credibility and trust Core competence <i>"Team members are satisfied from their job"</i> <i>"Team members demonstrate high credibility and trust"</i> <i>"Team members increase their competence through team processes"</i> TEAM (BEHAVIORAL) Low turnover and absenteeism Team capability for future challenges <i>"Team has low turnover and absenteeism"</i>
INDIVIDUAL CHARACTERISTICS Member skills Knowledge Attitude <i>"Members have the right mix of skills"</i> <i>"Members have positive attitude"</i>	RELATIONSHIPS Collaboration Communication - Feedback Trust Cohesiveness <i>"Team has an open communication structure that allows all members to participate"</i> <i>"Team is highly cohesive and cooperative"</i>	PERFORMANCE High quality and Productivity Continuous improvement Decreased costs and effective use of time <i>"Team offers high quality services"</i> <i>"Team members are committed to continuous improvement"</i> <i>"Team uses resources and time effectively"</i>
TEAM CHARACTERISTICS Design Composition <i>"Member assignments match their abilities"</i>	LEADERSHIP Strategic Focus - Goals and priorities setting Supervision Role modeling Change management <i>"Team leader keeps the team focused on a manageable set of priorities"</i> <i>"Team leader provides feedback"</i> <i>"Team leader serves as a positive role model"</i>	
ENVIRONMENTAL CHARACTERISTICS Organization Structure Culture - climate Stress Resources Rewards <i>"Team climate promotes collaboration"</i> <i>"Teams stress does not influence performance negatively"</i> <i>"Team members are rewarded for exceptional performance"</i>		

2. Further research

This study provides a baseline for additional studies using the team effectiveness model and a survey (checklist). Other teams inside the HNSC or the Hellenic Navy could use these instruments to assess their effectiveness. However, it is recommended that any study adjust the checklist to match each team's specific tasks. This study provides guidelines for a pilot study for other Departments inside the Hellenic Navy Logistics Command to improve team design and performance.

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APPENDIX

Survey on assessing team effectiveness: What makes a high performance team? (adapted from Wheelan, 1999, p.47–49)

The High Performance Team Checklist

Organization Name

Business/Division, Area Name

Team ID Number

Member ID Number

Date

Team size

Please read the statements below. Circle the number that most accurately describes your response to the statement. Use the following key to respond each statement.

1. Disagree strongly
2. Disagree to some extend
3. Agree to some extend
4. Agree strongly

- | | | | | |
|---|---|---|---|---|
| 1. Members are clear about team goals and their tasks. | 1 | 2 | 3 | 4 |
| 2. Tasks require members to work together. | 1 | 2 | 3 | 4 |
| 3. Members have the right mix of skills. | 1 | 2 | 3 | 4 |
| 4. Team members have positive attitude | 1 | 2 | 3 | 4 |
| 5. Member assignments match their abilities. | 1 | 2 | 3 | 4 |
| 6. Team climate promotes collaboration. | 1 | 2 | 3 | 4 |
| 7. Teams stress does not influence performance negatively. | 1 | 2 | 3 | 4 |
| 8. Team members are rewarded for exceptional performance. | 1 | 2 | 3 | 4 |
| 9. Team members are clear about their roles and responsibilities. | 1 | 2 | 3 | 4 |
| 10. Teams norms encourage innovative solutions. | 1 | 2 | 3 | 4 |
| 11. Team uses effective decision making strategies. | 1 | 2 | 3 | 4 |
| 12. Team implements its solutions and decisions. | 1 | 2 | 3 | 4 |
| 13. Team uses effective conflict management strategies. | 1 | 2 | 3 | 4 |

- | | | | | |
|---|---|---|---|---|
| 14. Team is highly cohesive and cooperative. | 1 | 2 | 3 | 4 |
| 15. Team has an open communication structure that
allows all members to participate. | 1 | 2 | 3 | 4 |
| 16. Team leader keeps the team focused on a manageable set
of priorities | 1 | 2 | 3 | 4 |
| 17. Team leader provides feedback | 1 | 2 | 3 | 4 |
| 18. Team leader serves as a role model | 1 | 2 | 3 | 4 |
| 19. Team members are satisfied from their job | | | | |
| 20. Team members demonstrate high credibility and trust | 1 | 2 | 3 | 4 |
| 21. Team members increase their competence through
team processes. | 1 | 2 | 3 | 4 |
| 22. Team has low turnover and absenteeism. | 1 | 2 | 3 | 4 |
| 23. Team offers high quality services. | 1 | 2 | 3 | 4 |
| 24. Team members are committed to continuous improvement. | 1 | 2 | 3 | 4 |
| 25. Team uses resources and time effectively. | 1 | 2 | 3 | 4 |

Minimum score: 25

Maximum score: 100

My score:

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